

CLAIMS

What is claimed is:

1. A fire door lock mechanism, comprising:

a first opening unit located inside a fire door and coupled to an opening member mounted on a surface of the fire door for operating a lock bolt of a lock bolt mount that is disposed inside the first opening unit to allow the fire door lock mechanism to enter a released or engaged state;

a second opening unit mounted on an opposite surface of the fire door corresponding in position to the opening member and having a handlebar thereon;

an actuator rotatably disposed in the handlebar and bent to form a central portion and two end portions;

a push rod coupled to one of the end portions of the actuator; and

a swing arm coupled to an end of the push rod and extended to the inside of the fire door, the swing arm being driven by a motion of the push rod coupled to the handlebar to operate the lock bolt and allow the fire door lock mechanism to enter the corresponding released or engaged state.

2. The mechanism of claim 1, wherein the opening member is a rotational handle coupled to a rotation member which is mounted inside the fire door and comprises an upper disk and a lower disk, the upper and lower disks being used to rotate an upper rotatable plate and a lower rotatable plate each being provided with an arm used to drive the lock bolt mount to move horizontally.

3. The mechanism of claim 1, wherein the second opening unit further comprises a lock cover whose bottom is connected to a lock cover mount plate and whose one end is coupled to a base plate for securing the base plate to a recessed base mount.

4. The mechanism of claim 3, wherein a first horseshoe is provided at each of two ends of

the base plate, and a hole is formed at the bottom of the first horseshoe.

5. The mechanism of claim 1, wherein the actuator is bent by a right angle to form the central portion, a left end portion and a right end portion, and each of the portions is formed with at least one hole.

6. The mechanism of claim 5, wherein a second horseshoe having a hole is provided at each of two bottom ends of the handlebar, so as to allow each end of the push rod to be connected to the second horseshoe by a shim which is coupled to the hole of the second horseshoe and further coupled to the hole of one of the portions of the actuator.

7. The mechanism of claim 1, wherein a link arm has one end coupled to an end of the push rod and the other end coupled to the swing arm, so as to receive the motion of the push rod and generate a horizontal force to induce the swing arm to generate a swing motion.

8. The mechanism of claim 7, wherein the link arm and the swing arm are accommodated in a lock cover mount, and the swing arm is connected to the lock cover mount by a shim to generate the swing motion.

9. The mechanism of claim 8, wherein the end of the link arm, coupled to the swing arm, is formed with a bent portion bent by a right angle, and a hole is formed at the bottom of the bent portion and accommodates a shim connected to a hole located at a central position of the swing arm and further connected to a slot of the lock cover mount.

10. The mechanism of claim 8, wherein the swing arm is formed with a hole for accommodating a shim which is coupled to a hole of the lock cover mount, such that the shim serves as a pivot for allowing the swing arm to be induced by the link arm and generate the swing motion.

11. The mechanism of claim 8, wherein a hole is formed at the bottom of the swing arm for accommodating a shim used to secure a pulley to the bottom of the swing arm.

12. The mechanism of claim 1, wherein the first opening unit located inside the fire door further comprises a lock body whose bottom has a slot that horizontally corresponds in position to a protrusion of the lock bolt mount, so as to allow the swing arm to extend into the slot and to be coupled to the protrusion of the lock bolt mount, making the lock bolt mount moved horizontally by a swing motion of the swing arm.

13. The mechanism of claim 12, wherein the bottom of the lock cover mount is coupled to a lock cover mount plate having a slot formed at a central position, so as to allow the bottom of the swing arm to extend through the slot of the lock cover mount plate to the slot of the lock body.

14. The mechanism of claim 1, wherein a through hole is formed at a central position of the lock bolt mount for accommodating a shaft having a flat close end and an open end that is formed with a hole of a predetermined depth, so as to allow a rod sleeved with an elastic member thereon to be inserted into the hole of the shaft.

15. The mechanism of claim 14, wherein a flange having a diameter larger than a diameter of the elastic member is disposed at one end of the rod, so as to secure the elastic member at the flange, and a length of the elastic member is larger than a length of the rod and the depth of the hole in the shaft.

16. The mechanism of claim 1, wherein the lock bolt mount is made of a heat melting material.